DOCUMENT RESUME

ED 098 499		CS 001 386
AUTHOR	Dixon, Lois S.	
TITLE	Generalization Testing as an Analysis of the Acquired Semantics of a Receptively Trained Discrimination.	
PUB DATE	Sep 74	
NOTE	14p.; Paper presented at the Annual Meeting of the American Psychological Association (82nd, New Orleans, Louisiana, Aug. 30-Sept. 3, 1974)	
EDRS PRICE	MF-$0.75 HC-$1.50 PLUS POSTAGE	
DESCRIPTORS	*Discrimination Learning; *Language Skills; Perceptual Development; Primary Grades; Reading; *Reading Research; Reinforcement; *Semantics; *Thought Processes	

ABSTRACT

The purpose of this study was to determine if children given spatial relationship training had learned a definition and/or conceptualization of "in front" which was limited to two distinctly different classes of objects functioning in a specific relationship. Twenty-one children who had completed the "in front" training were given three sets of stimuli where the relational objects were given some or all of the properties of the referent objects as used in the training program. The trained criterion discrimination was tested prior to each generalization test to insure that the trained discrimination was maintained. All correct responses were reinforced. Six of the 21 children scored 81 percent correct or better on all three tests. Subsequent research with these children showed that they maintained their performance under various changes in the structure of the verbal instruction, such as: "Point to the duck in front of the cow"; "Point to the one in front of the cow"; "Point to the cow in front." Two of the 21 children performed at or near chance level on all three tests, and of the 13 remaining children, nearly all performed at a high level of accuracy on both the full-face orientation and the opposite profile orientation. (WR)

Generalization Testing as an Analysis of the Acquired Semantics of a Receptively Trained Discrimination

Lois S. Dixon

University of Kansas

(Presented as part of a symposium at the Eighty-Second Annual Convention of the American Psychological Association, New Orleans, 1974)

Over the past several decades, questions regarding semantics and meaning have been primarily the concern of philosophers. Much more recently such questions have become of interest to psychologists (Skinner, 1957; Olson, 1970) and psycholinguists (Brown, 1973; Clark, 1973). Olson (1970) advanced a theory of semantics in which he describes "meaning" as being a function of referential alternatives (incorrect choices) which differentiate the designated event.

Using Olson's example of the "meaning" of the word square (Slide 1) in referring to the geometric shape, there is an ambiguous meaning if only the event itself is present. However, as alternate choices are also presented (Slide 2) such as a circle, triangle, and rectangle, the differentiating properties of the square shape become the meaning of the word square.

Many investigators in discrimination learning, attention, and stimulus control would probably be in general agreement with Olson that what is "known" about an event, or discriminated, is determined at least in part by the alternatives. However, it is also generally accepted by these investigators that the stimulus elements (dimensions, properties, or features) which come to control a response cannot be predicted from examination of the stimuli, per se (e.g., Lashley, 1938; Lovaas & Schrieber, 1971; Reynolds, 1961; Stoddard, 1968; Touchette, 1969). In concept training, the specific stimuli are typically varied to ensure that the child is attending to the general element or dimension used for the classification. Yet the question of what stimulus-response relation has been established still needs to be examined.

In the applied setting, we may paraphrase the question of controlling stimulus-response relation to one of the child's "definition" of the trained concept. Observing that a child consistently selects a square figure from the alternatives of a circle, triangle, and rectangle does not necessarily mean that the child's "definition" of square is "straight-edged, four-sided, symmetric" (Olson, 1970).

In an earlier study by Dixon, Spradlin and Etzel (1973), retarded children were trained to select an in front spatial relationship (Slide 3) from three other relationships: over, under, and behind. One pictured object forming each relationship was always animate and in profile, while the second object was inanimate and symmetric along its own vertical axis. The animate object was always the point of reference and referred to as the "referent object" (Slide 4). The inanimate object was called the "relational object" as its position was described relative to the position of the referent object (i.e., the ball in front of the bear). Since the relational objects were vertically symmetric, they provided no left-right orientation cues upon which the children would have based their discriminations. However, the use of two classes of objects with one (animate with orientation) always functioning as a referent object, and the second (inanimate without orientation) as the relational object permits the possibility that the child will always treat similar objects as having those specific functions rather than having function determined by the verbal instructions.

The purpose of the current study can be stated in two ways. 1) Had the properties of the relational object become a part of the stimulus-response relation? Or 2) had the children learned a definition and/or conceptualization of in front which was limited to two distinctly different classes of objects functioning in a specific relationship?

Twenty-one children who had completed the in front training were given three sets of stimuli where the relational objects were given some or all of the properties of the referent objects as used in the training program. In one set of stimuli (Slide 5), the relational object was animate and shown in a full-face orientation which retained the property of vertical symmetry as in the trained stimuli. (Slide 6) A second set of stimuli included an animate relational object in a profile orientation. While the relational object consisted of all the properties of the referent object, the orientation was the opposite that of the referent. In the third set of stimuli (Slide 7), the relational object was in the same profile orientation as the referent object.

The three sets of stimuli were presented in three sessions in a counterbalanced order across subjects. The trained criterion discrimination was tested prior to each generalization test to insure the trained dicrimination was maintained. All correct responses were reinforced.

Six of the 21 children (or approximately 33%) scored 81% correct or better on all three tests. These children were not basing their discriminations upon the specific properties of the two classes of objects used in

training. The children maintained performance when the properties of the relational objects were varied to the point of being the same as the referent objects. These six children were able to discriminate between two in front relationships on the same profile orientation stimuli on the basis of the verbal instructions. Subsequent research with these children showed that their performance maintained under various changes in the structure of the verbal instruction such as "Point to the duck in front of the cow;" "Point to the one in front of the cow;" "Point to the cow in front." Their performances demonstrate a definite semantic relationship between the linguistic context and the nonlinguistic or visual context.

Two of the 21 children performed at or near chance level on all three tests indicating their definition of the in front spatial relationship was quite limited to the specific visual properties of trained relational objects. In addition, subsequent research with these two children on the trained stimuli showed they continued to respond to the in front relationship regardless of the spatial preposition presented. The training provided to these children had given them a limited conceptual organization of an in front relationship, but it did not appear to be an organization related to the linguistic variables.

Of the 13 remaining children, nearly all performed at a high level of accuracy on both the full-face orientation and the opposite profile orientation. However, 10 of these children performed at 50% accuracy on the same profile orientation. They were not able to discriminate between the two

in front relationships. Their definition of *in front* did not extend to situations in which it was necessary to attend to the word order of the verbal instructions. However, over half of these children rapidly acquired the discrimination or appropriate semantic relationship between linguistic and nonlinguistic elements in subsequent sessions.

There are at least two conditions in which a systematic manipulation of variables within the criterion stimuli is very important. First, it is extremely helpful to know what variables are functi[illegible] or a given child before moving him to the next step of a training sequence. If the next step in the sequence involves a manipulation of variables as in the *in front* program, the child should be attending to those variables. If he is not, then the manipulation will not be effective. Even when a manipulation is not involved, it is advisable to know that the child is correct for the "appropriate reasons" on one step before taking him on to more difficult material. Second, there are many instances when it is desirable to be able to predict some of the conditions, other than the trained condition, in which you would expect the child to respond appropriately and in which you would not expect appropriate responding. The value of systematically manipulating variables within criterion stimuli is not only to determine whether or not the behavior will "generalize" or to learn what has become critical for a particular child, but to be able to specify the conditions which must be present to maintain the discrimination. This information may also be used to predict where "generalization" will occur. There are many instances where state-

ments are made regarding the failure t monstrate generalization that perhaps should be directed toward the failure to teach a discrimination of a variable common to the untrained and trained situations. If a child learns to discriminate irrelevant aspect(s) of the trained stimuli, we can only expect further differential responding as long as those aspects are present.

Brown, R. A first language/The early stages. Boston: The President and Fellows of Harvard College, 1973.

Clark, E. What's in a word? On the child's acquisition of semantics in his first language. In T. Moore (Ed.), Acquisition of language. New York: Academic Press, 1973.

Dixon, L. S., Spradlin, J. E., & Etzel, B. E. A study of stimulus control procedures to teach an "in front" sptaial discrimination. Paper presented at the 1973 Biannual Meeting of the Society for Research in Child Development. Philadelphia, 1973.

Lashley, K. S. The mechanism of vision: XV. Preliminary studies of the rats' capacity for detailed vision. Journal of Genetic Psychology, 1938, 18, 123-193.

Lovaas, O. I., & Schrieber, L. Stimulus overselectivity of autistic children in a two stimulus situation. Behavior Research and Therapy, 1971, 9, 305-310.

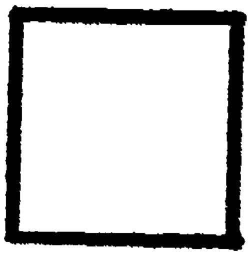
Olson, D. Language and thought: Aspects of a cognitive theory of semantics. Psychological Review, 1970, 4, 257-273.

Reynolds, G. S. Attention in the pigeon. Journal of Experimental Analysis of Behavior, 1961, 4, 203-208.

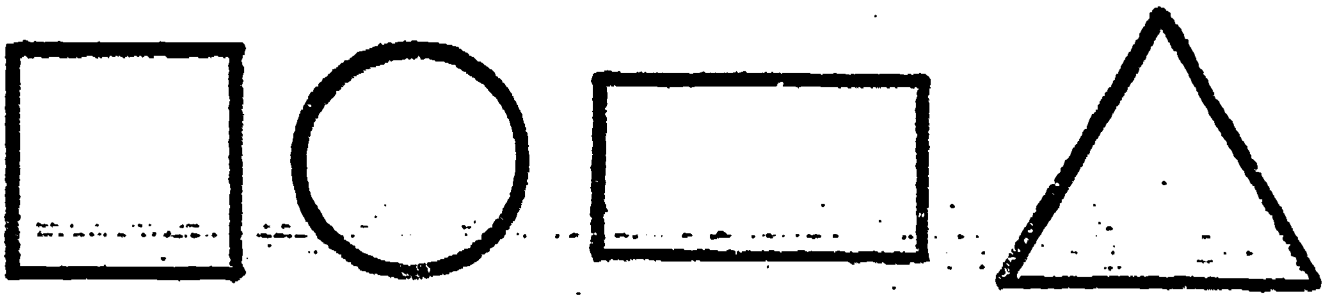
Skinner, B. F. Verbal behavior. New York: Appleton-Century-Crofts, 1957.

Stoddard, L. T. An observation of stimulus control in a line tilt discrimination by children. Journal of Experimental Analysis of Behavior, 1968, 4, 321-324.

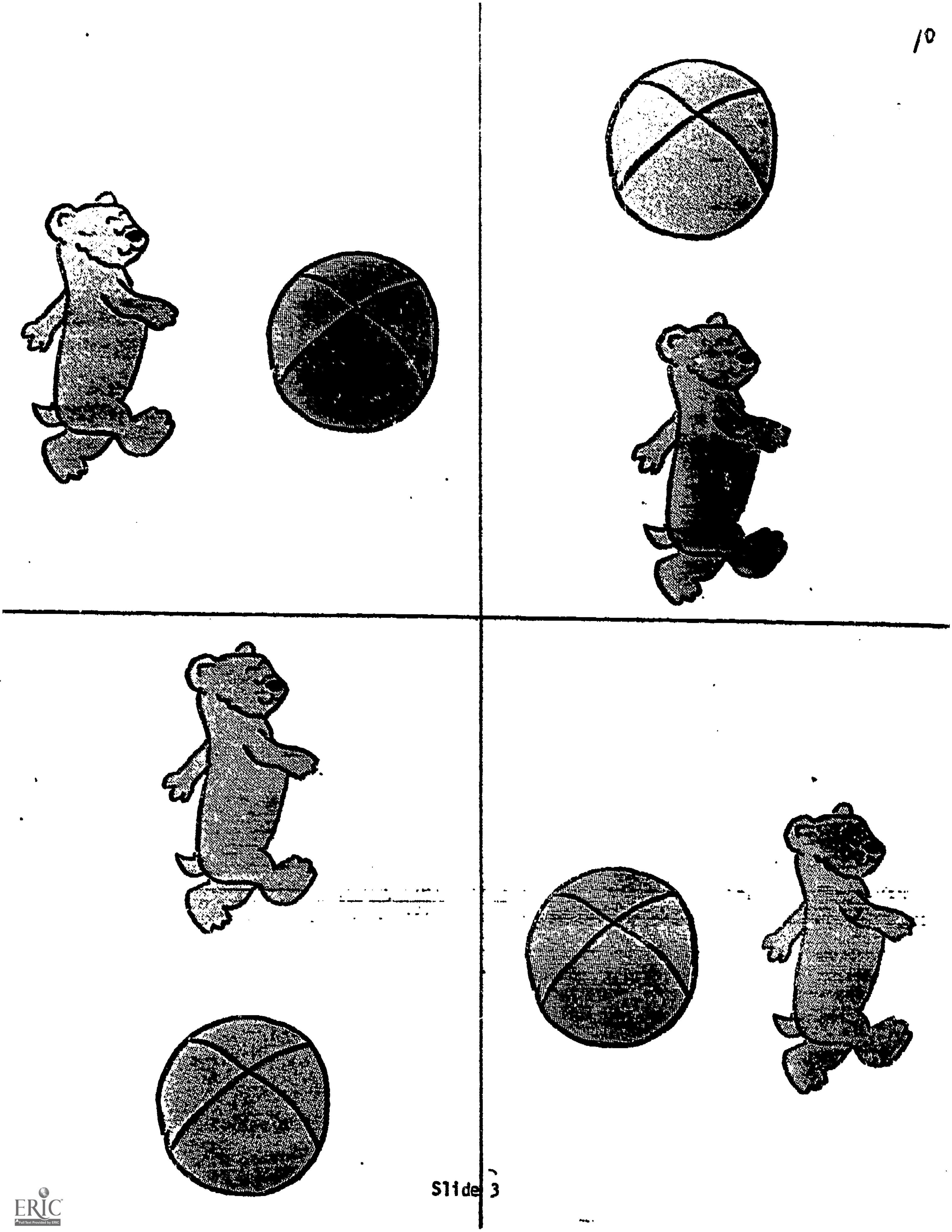
Touchette, P. Tilted lines as complex stimuli. Journal of Experimental Analysis of Behavior, 1969, 11, 39-48.



Slide 1

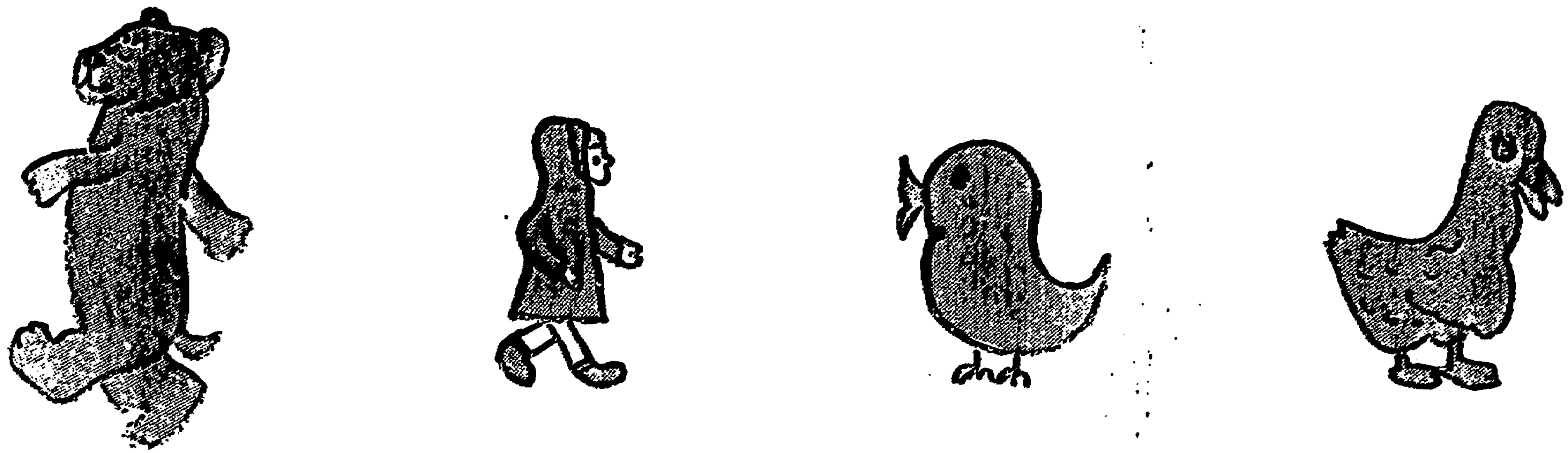


Slide 2

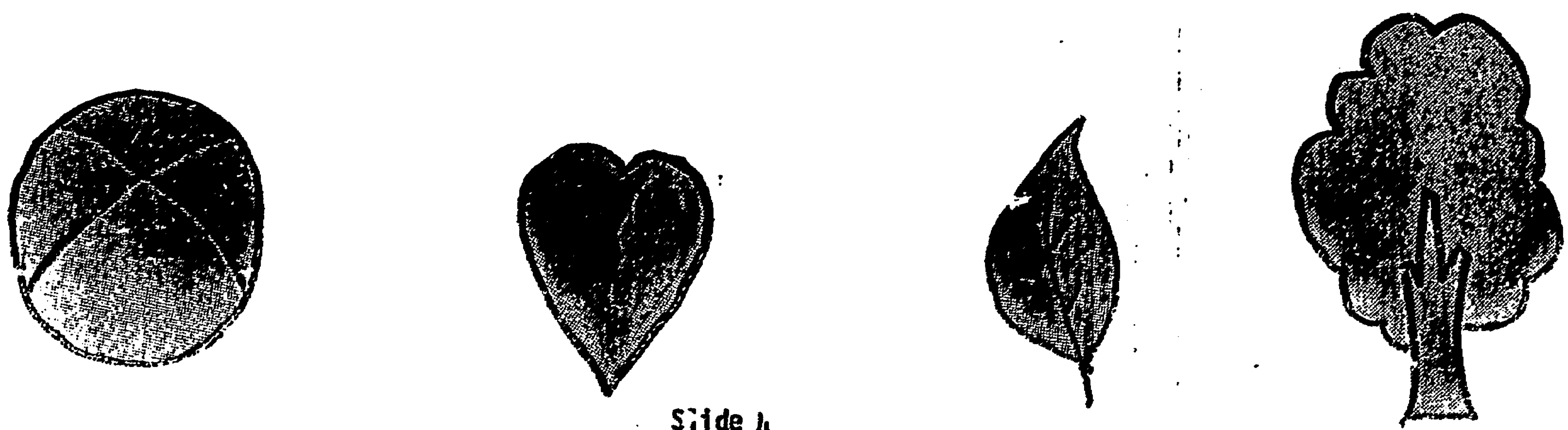


Slide 3

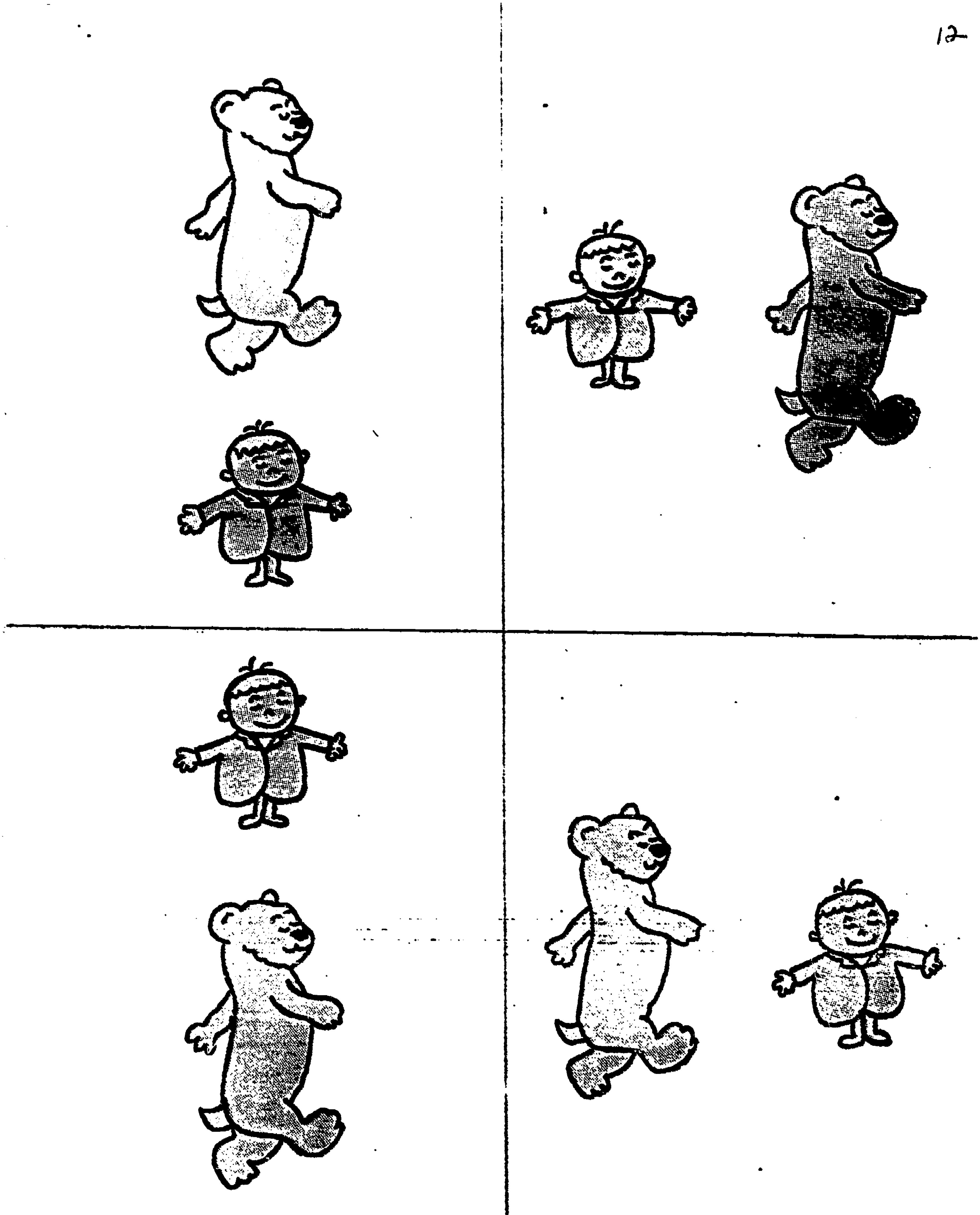
REFERENT OBJECTS



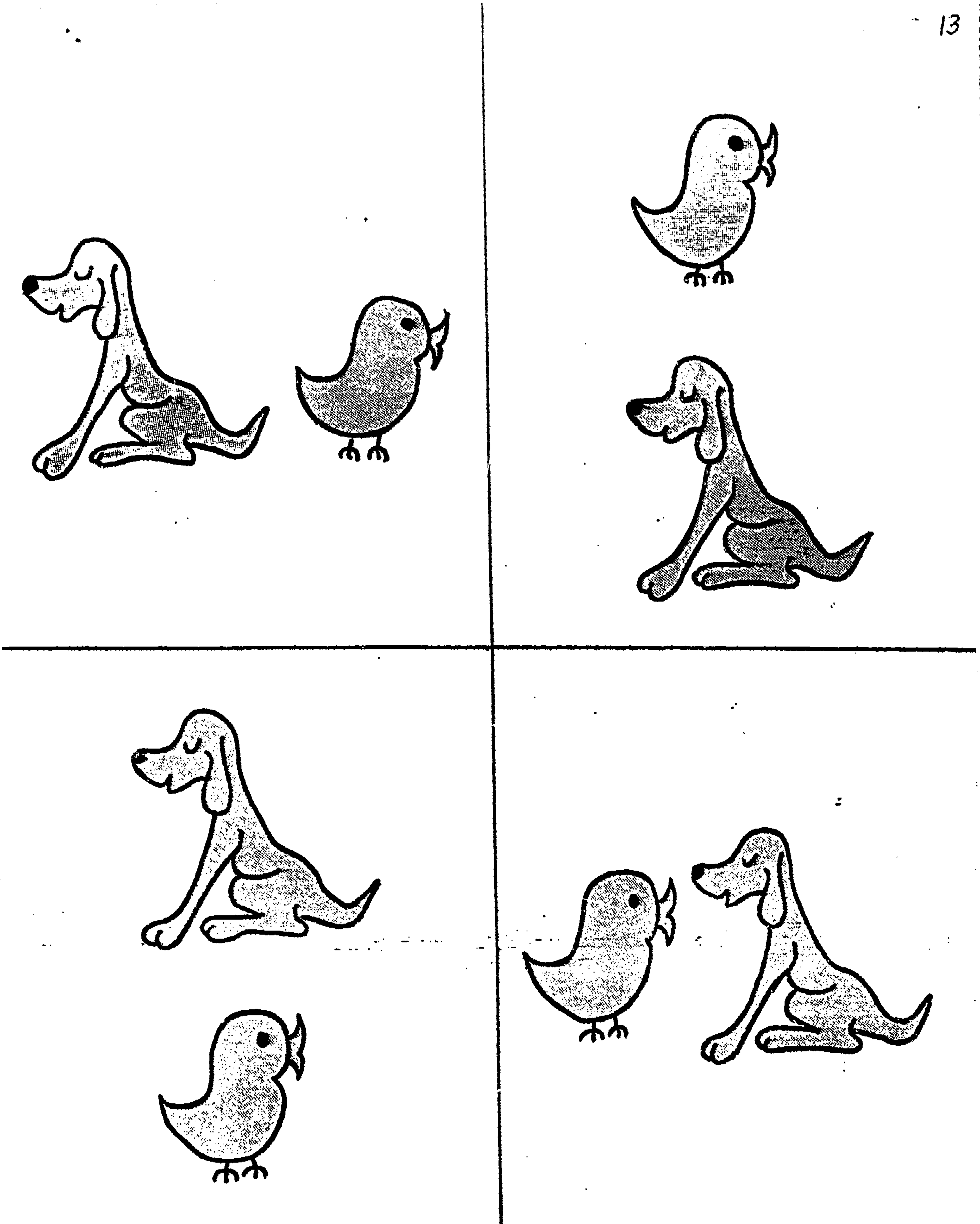
RELATIONAL OBJECTS



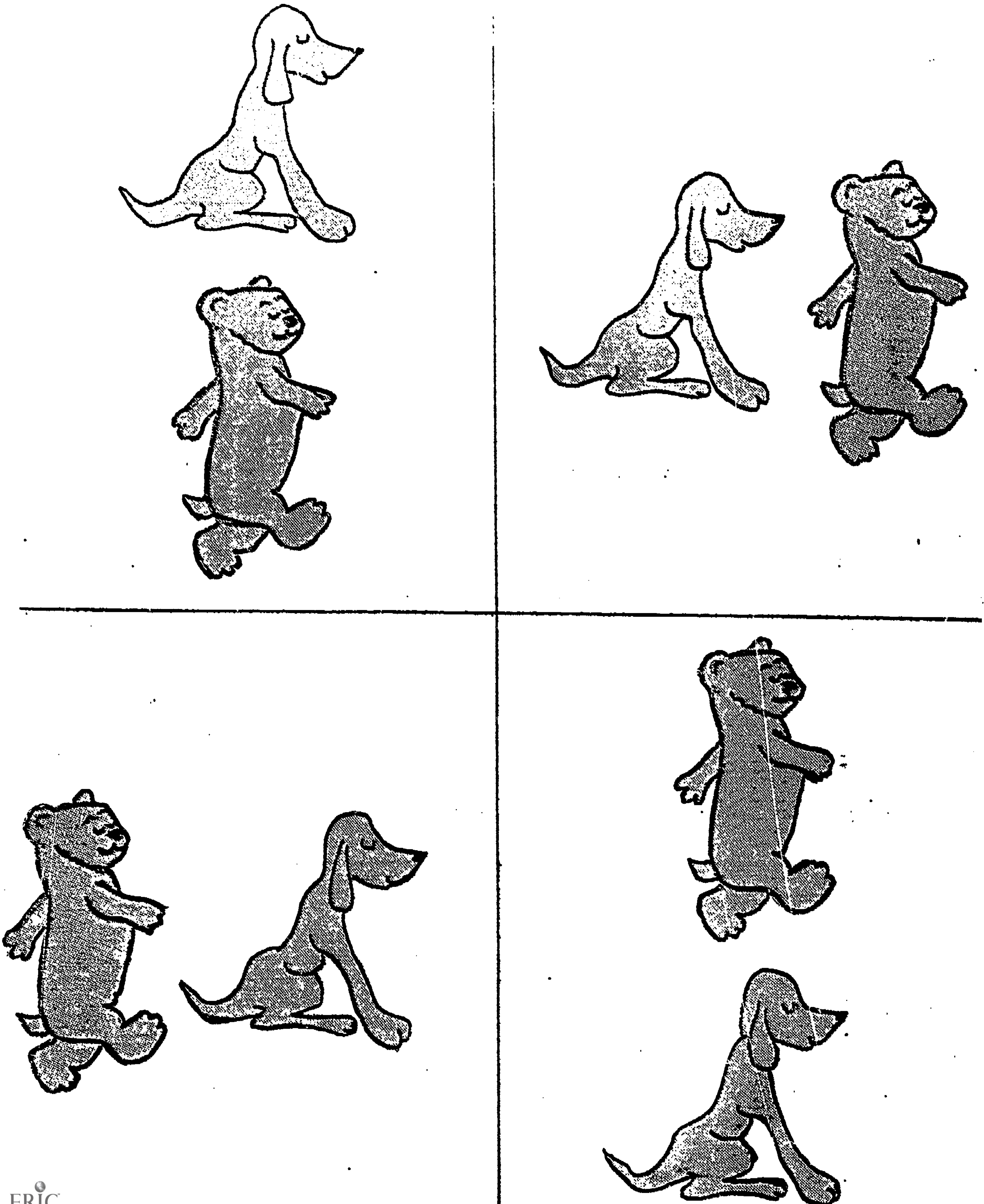
Slide 4



Slide 5



Slide 6



Slide 7